Amendments to the Specification:

Please replace the paragraph beginning at page 2, line 20 with the following rewritten paragraph:

Matching networks such as networks 20a-20c shown in Figs. 1-3 can include tuning elements that are fixed or variable. Variable tuning elements, which include variable capacitors, and/or variable inductors, provide a matching network with continuously adjustable impedance matching. Such continuous adjustability provides the benefit of continuously matching the impedance of an ac power source to a load that has transient and variable impedance. Thus, a controllable amount of energy may be transferred to a load. For example, if the load is a plasma having a transient and variable impedance, by supplying a controllable amount of energy to the plasma through impedance matching, the plasma can be maintained in a relatively stable state.

Please replace the paragraph beginning at page 5, line 25 with the following rewritten paragraph:

Energy transfer from the ac power source and first transmission line to the second transmission line and load is improved if the inductive length is at least one wavelength of the ac energy. Thus, in order to ensure energy reflected from the load back to the ac power source is effectively minimized, the inductive length should be at least one wavelength of the ac energy. AC energy traveling in transmission line 140a not inductively coupled to transmission line 140b is prevented from reflecting from ground be a trimming element 170. Trimming element 170 is typically a ~~register~~ resistor used to match the transmission line impedance to ground.

Listing of Claims:

1. (Currently amended): A matching network that can be coupled between an ac power source and a load to reduce ac energy reflected from said load, said matching network comprising:

(a) a first transmission line that can be coupled to said ac power source; and

(b) a second transmission line inductively coupled to said first transmission line, wherein said first and second transmission lines are inductively coupled for an inductive length, said inductive length being at least one wavelength of ac energy supplied by said ac power source, wherein said second transmission line can be coupled to said load to deliver ac energy from said first transmission line to said load, and wherein said first and second transmission lines within said inductive length are a constant fixed distance apart and are bent to reduce their overall dimension.

2. (Original): The matching network of claim 1 wherein said inductive length is at least 0.75 meters.

3. (Original): The matching network of claim 1 further comprising:

(c) a trimming element coupled to said first transmission line and coupled to ground.

4. (Canceled)

5. - 8. (Withdrawn)

9. (Currently amended): A method for minimizing reflected ac power from a plasma formed in a substrate processing chamber, said method comprising:

coupling an ac power source generating ac energy of a specified wavelength to said plasma in said substrate processing chamber;

coupling a matching network between said ac power source and said plasma, said matching network comprising a first transmission line and a second transmission line, wherein said first and second transmission lines are inductively coupled over an inductive length, said inductive length being at least one of said specified wavelength, and wherein said first and second transmission lines within said inductive length are a constant fixed distance apart and are bent to reduce their overall dimension.

10. (Original): The method of claim 9 wherein said first transmission line receives ac energy from said ac power source, said second transmission line inductively receives ac energy from said first transmission line, and said second transmission line delivers ac energy to said plasma.

11. (Canceled)

12. - 13. (Withdrawn)

14. (Currently amended): A method for minimizing reflected ac power from a plasma formed in a substrate processing chamber, said method comprising:

generating an ac power signal having a specified wavelength and transmitting said signal to a first transmission line that is inductively coupled to a second transmission line over an inductive length, wherein said inductive length is at least one of said specified wavelength, and wherein said first and second transmission lines within said inductive length are a constant fixed distance apart and are bent to reduce their overall dimension; and

transmitting said ac power signal from said second transmission line to a substrate processing chamber.

15. (Original): The method of claim 14 wherein said ac power signal has a frequency range of operation between 100 KHz to 2.45 GHz and said inductive length is between 3000 and 0.12 meters.

16. (Original): The method of claim 14 wherein said ac power signal has a frequency between 350 KHz and 400 MHz and said inductive length is between 857 meters and 0.75 meters.

17. (Currently amended): An energy delivery system comprising:

an ac power source capable of generating an ac signal of at least 100 KHz;

a matching network having a first transmission line that can be coupled to said ac power source, a second transmission line inductively coupled to said first transmission line, wherein said first and second transmission lines are inductively coupled for an inductive length, said inductive length being at least 0.75 meters, and wherein said first and second transmission lines within said inductive length are a constant fixed distance apart and are bent to reduce their overall dimension; and

a load coupled to said second transmission line.

18. (Original): The matching network of claim 17 wherein said ac power source is an RF generator and said load is a plasma.

19. (Currently amended): A substrate processing system comprising:

(a) an RF generator;

(b) a substrate processing chamber; and

(c) a matching network having a first and second transmission line, said first transmission line being coupled to said RF generator; said second transmission line being coupled to said substrate processing chamber, where said first and second transmission lines are inductively coupled over an inductive length, and wherein said first

and second transmission lines within said inductive length are an approximately fixed distance apart and are bent to reduce their overall dimension.

20. (New): The matching network of claim 1, wherein the first and second transmission lines are bent to reduce their overall dimension to approximately a meter or less along any direction.

21. (New): The matching network of claim 1, wherein the first and second transmission lines are bent in a spiral to reduce their overall dimension.

REMARKS/ARGUMENTS

Claims 1-4, 9-11, and 14-21 are currently pending. Claims 1, 9, 14, 17, and 19 have been amended and new claims 20-21 have been added. Support for amendments to claims 1, 9, 14, 17, and 19 and for new claims 20 and 21 may be found in the application as originally filed at page 6, lines 9-11.

The specification at page 5, line 31 is objected to. Page 5 at line 31 has been amended to address the Examiner's concerns. Also, the specification in the paragraph beginning at page 2, line 20 has been amended to address typographical issues.

Claims 1 and 4 are rejected under 35 U.S.C. §103(a) as being unpatentable over Thomas (U.S. Patent No. 3,654,570). Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Thomas in view of Heiter (U.S. Patent No. 5,933,770). Claims 2, 9-11, and 14-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Barnes et al. (U.S. Patent No. 5,793,162) in view of Thomas.

Claims 1, 9, 14, 17, and 19 have been amended to overcome these rejections. For example, claim 1 have been amended to recite "said first and second transmission lines within said inductive length are a constant fixed distance apart and are bent to reduce their overall dimension."

Thomas does not teach or suggest every limitation recited in amended claim 1. Thomas, as understood, discloses a coaxial hybrid junction device that includes first and second conductors that are inductively coupled. Thomas's conductors are approximately parallel within a fixed length and then diverge to meet a set of center pin connectors. See Thomas's FIG. 1. Within the fixed length in which Thomas's conductors are approximately parallel, the conductors are not bent to reduce their overall dimension. Moreover, there is no motivation to bend Thomas's conductors as such bending would alter the divergence angle of the conductors, which is "[a]n important feature" that should be "finite" and have "ascertainable positions." See Thomas at Col. 3, lines 43-45. Because an important feature of Thomas's junction would be altered in bending the junction, there is not motivation to bend the junction. Therefore, Thomas

fails to teach, or even suggest, every limitation recited in amended claim 1. Therefore, Thomas fails to render amended claim 1 obvious.

Thomas, in combination with Barnes, fails to teach or suggest every limitation recited in amended claims 9. Similar to claim 1, claim 9 has been amended to recite, "said first and second transmission lines within said inductive length are a constant fixed distance apart and are bent to reduce their overall dimension." As discussed above with respect to claim 1, Thomas fails to teach or suggest the above limitations recited in amended claim 9. Barnes fails to make up for the deficiencies of Thomas.

Barnes, as understood, discloses a system for adjusting the resistance and reactance of a matching network that includes a set of capacitors. Barnes system includes a directional coupler configured to receive signals reflected from a cable and the matching network. The reflected signals are processed by an RF amplitude detector, which forwards amplitude information for the reflected signals to a digital controller. The digital controller is configured to control a set of DC motors, which in turn adjust the capacitance of a set of capacitors that form a portion of Barnes's matching network. Capacitance adjustments effect changes in the resistance and reactance of Barnes's matching network. See Barnes at Col. 4, line 6 to Col. 5, line 10. As Barnes's matching network includes capacitors and does not include transmission lines, Barnes fails to teach or suggest a matching network that includes transmission lines that are "are a constant fixed distance apart and are bent to reduce their overall dimension" as recited in amended claim 9. Therefore, Barnes fails to make up for the deficiencies of Thomas. Therefore, Barnes and Thomas fail to render amended claim 9 obvious.

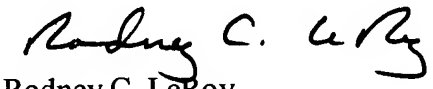
Claims 14, 17, and 19 have each been amended to recite similar limitations as amended claim 9, and are therefore, not rendered obvious by Thomas and Barnes.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



Rodney C. LeRoy
Reg. No. 53,205

TOWNSEND and TOWNSEND and CREW LLP

Tel: 650-326-2400
Fax: 415-576-0300
RCL:cmm
PA 3301556 v1